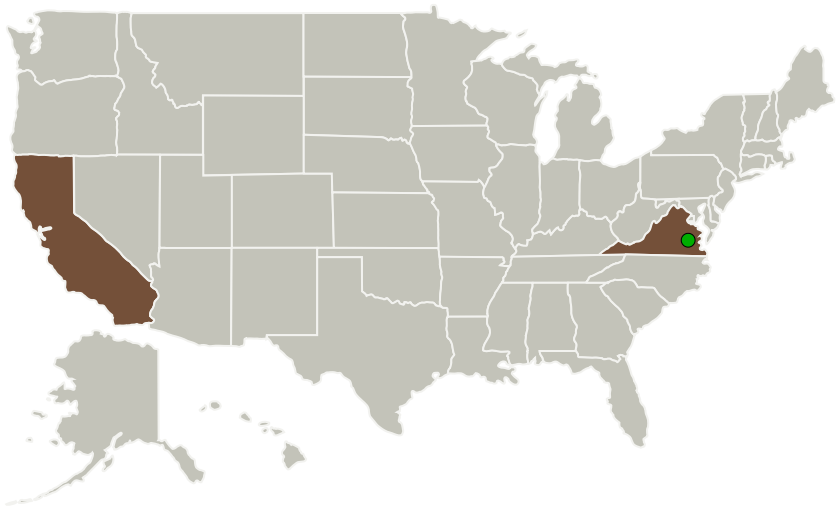
Compact Telescoping Array Design and Development, Phase I

Completed Technology Project (2015 - 2015)

Project Introduction

NASA has significant interest in developing solar electric propulsion technology (SEP) and has identified SEP as enabling for many of NASA's near-term and long-term missions, including the asteroid redirect mission (ARM). Large, scalable solar arrays are critical to enabling SEP missions, and could also serve many other sub-sections of the civil, commercial, and defense space markets. A recently published paper by NIA and NASA shows the Compact Telescoping Array (CTA) concept, which possesses the potential for 60 kW/m3 at 1 MW of power with an elegantly simple design concept derived in part from the international space station (ISS) solar array. The potential performance of CTA, including packing density, scalability and structural efficiency, is excellent. This array technology appears to be an excellent path forward for many current mission needs. Since the vast majority of CTA's subsystems can be implemented with elements that possess significant flight heritage, it is expected that significant progress can be made under SBIR funding to prepare CTA for infusion in the market. The proposed work advances the conceptual work begun by Mikulas, Pappa, Warren and Rose. Angstrom Designs, partnered with ATK space, proposes to explore combining flight-heritage sub-systems to progress the CTA concept, increase the TRL of the overall design, and establish the path for successful commercial infusion.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Angstrom Designs, Inc.	Lead Organization	Industry	Santa Barbara, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

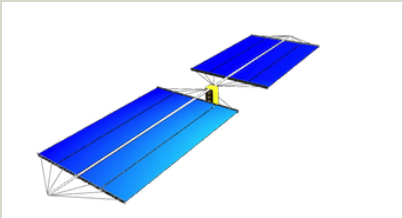
June 2015: Project Start

December 2015: Closed out

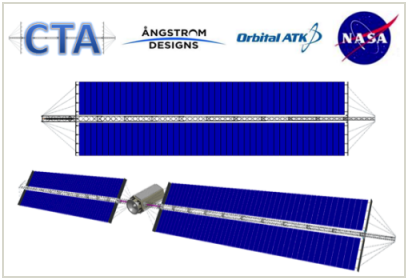
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138759)*

Images



Briefing Chart
Compact Telescoping Array Design and Development Briefing Chart *(https://techport.nasa.gov/image/126335)*



Final Summary Chart Image
Compact Telescoping Array Design and Development, Phase I Project Image *(https://techport.nasa.gov/image/132673)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Angstrom Designs, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Casey P Hare

Co-Investigator:
Casey Hare

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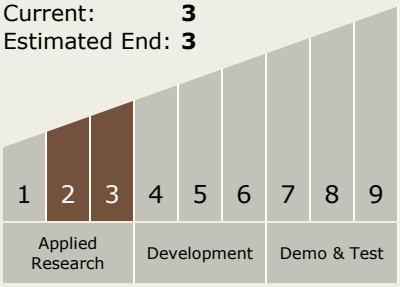
Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.2 Structures
    - TX12.2.1 Lightweight Concepts

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System